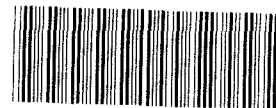




## INTEROFFICE CORRESPONDENCE



000068710

DATE: February 3, 1998

TO: ~~WMA~~ File

FROM: C. L. Guthrie, Engineering/Construction/Decommissioning/Facilities, Bldg. T130F, X7419

SUBJECT: BUILDING 123 DECOMMISSIONING PROJECT, HEALTH AND SAFETY PLAN,  
REVISION 0 - CLG-010-98

### PURPOSE

The purpose of this correspondence is to document that Revision 0 of the Building 123 Decommissioning Project, Health and Safety Plan was not issued as a controlled document.

### DISCUSSION

The requirement to issue Revision 0 of the Health and Safety Plan as a controlled document, was overlooked when the plan was finalized and approved in June 1997. This deficiency was noted when a minor revision to the plan was recently made. The deficiency was discussed with RMRS Document Control, and it was decided that the following actions would be most appropriate:

1. Revision 1, of the document, should be controlled as required. This document will be tracked under the Administrative Record for the project.
2. Documentation for the project history file should be prepared which explains that Revision 0 was mistakenly never controlled. This correspondence serves as that documentation.

Despite of the fact that Revision 0 of the Health and Safety Plan was not issued as a controlled document, it was an approved plan. All work on the Building 123 Decommissioning Project was conducted in accordance with Revision 0 of the Health and Safety Plan from June 1997 through February 1998.

### RESPONSE REQUIREMENTS

None required. If you have any questions regarding this matter, please contact me or Dortha Hoyt at extension 6742, digital page 6062.

DLH:alk

cc:

|               |             |
|---------------|-------------|
| T. A. Hopkins | w/o Attach. |
| D. L. Hoyt    | " "         |
| K. D. Jenkins | " "         |
| K. Manzanares | " "         |

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**ADMIN RECORD**  
B123-A-00046



Rocky Mountain  
Remediation Services, L.L.C.  
*... protecting the environment*

**RF/RMRS-97-022**

# **Building 123 Decommissioning Project Health and Safety Plan**

**Rocky Mountain Remediation Services, L. L. C.**

**REVISION 1**

**February 1998**

**BUILDING 123 DECOMMISSIONING PROJECT  
HEALTH AND SAFETY PLAN**

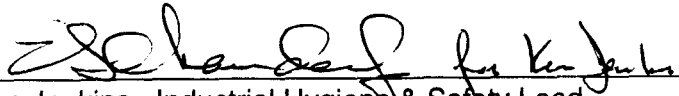
**REVISION 1**

**FEBRUARY 1998**

**This Health and Safety Plan has been reviewed and approved by:**

  
\_\_\_\_\_  
Vern Guthrie, Project Manager

1/30/98  
Date

  
\_\_\_\_\_  
Ken Jenkins, Industrial Hygiene & Safety Lead

1/30/98  
Date

## BUILDING 123 DECOMMISSIONING PROJECT

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## ACRONYMS

|        |   |
|--------|---|
| ACGIH  | American Conference of Governmental Industrial Hygienists |
| AHA    | Activity Hazard Analysis                                  |
| ANSI   | American National Standards Institute                     |
| D&D    | Decontamination and Decommissioning                       |
| DOE    | U. S. Department of Energy                                |
| ESH&Q  | Environmental, Safety, Health and Quality                 |
| GFCI   | Ground fault circuit interrupters                         |
| HASP   | Health and Safety Plan                                    |
| HAZCOM | Hazard Communication Standard                             |
| HSP    | Health and Safety Plan                                    |
| IH&S   | Industrial Health and Safety                              |
| IWCP   | Integrated Work Control Program                           |
| JHA    | Job Hazard Analysis                                       |
| LAN    | Local Area Network  |
| LS/DW  | Life Safety/Disaster Warning System                       |
| MMF    | Man-Made Mineral Fibers                                   |
| MSDS   | Material Safety Data Sheet                                |
| NIOSH  | National Institute of Occupational Safety and Health      |
| OSHA   | Occupational Safety and Health Administration             |
| PCB    | Polychlorinated Biphenyl                                  |
| PHA    | Preliminary Hazard Analysis                               |
| PPE    | Personal Protective Equipment                             |
| RCM    | Radiological Controls Manual                              |
| RCT    | Radiological Control Technician                           |
| RFCA   | Rocky Flats Cleanup Agreement                             |
| RFETS  | Rocky Flats Environmental Technology Site                 |
| RLC    | Reconnaissance Level Characterization                     |
| RMRS   | Rocky Mountain Remediation Services, L. L. C.             |
| RWP    | Radiological Work Permit                                  |
| SAE    | Society of Automotive Engineers, Inc.                     |
| WBS    | Work Breakdown Structure                                  |



## **BUILDING 123 DECOMMISSIONING PROJECT HEALTH AND SAFETY PLAN**

### **1.0 INTRODUCTION**

#### **1.1 SCOPE AND APPLICABILITY**

The purpose of this Health and Safety Plan (HASP) is to identify, mitigate, and eliminate potential safety and health hazards associated with the decommissioning of the Building 123 Cluster Decommissioning Project. Procedures and controls will be identified in this HASP that will help prevent and reduce the risk of personnel injury and/or illness and property and/or environmental damage/impacts. This HASP is applicable to all decommissioning work related activities performed on Building 123 and its supporting facilities. Major activities include, but are not limited to:

- Sampling, characterization, and removal of chemical, hazardous, and radiological materials and waste;
- Associated equipment and utilities removal;
- Major decontamination activities;
- Building and structure dismantlement; and
- Remediation of contaminated soil and buried process waste lines.

Rocky Mountain Remediation Services, L. L. C., (RMRS) and its subcontractors will utilize the RMRS Safety Plan, subcontractor safety plans, Site Procedure 1-C18-HSP 24.01, Contract Section 01700, the U.S. Department of Energy (DOE) Handbook for Occupational Health & Safety during Hazardous Waste Activities, DOE Orders 5480.9a and 440.1 and the Site Health and Safety Practices (HSP) Manual as the upper tier documents to govern health and safety of the workers during the decommissioning process. Occupational Safety and Health Act (OSHA) Standards 29 CFR 1910 and 1926 will be utilized in conjunction with other approved company and sub-tier specific documents to ensure worker protection and safety. From a radiological standpoint, the DOE Radiological Controls Manual (RCM), 10 CFR 835 and the Rocky Flats Environmental Technology Site (RFETS) site-specific RCM will be utilized for worker radiological safety.

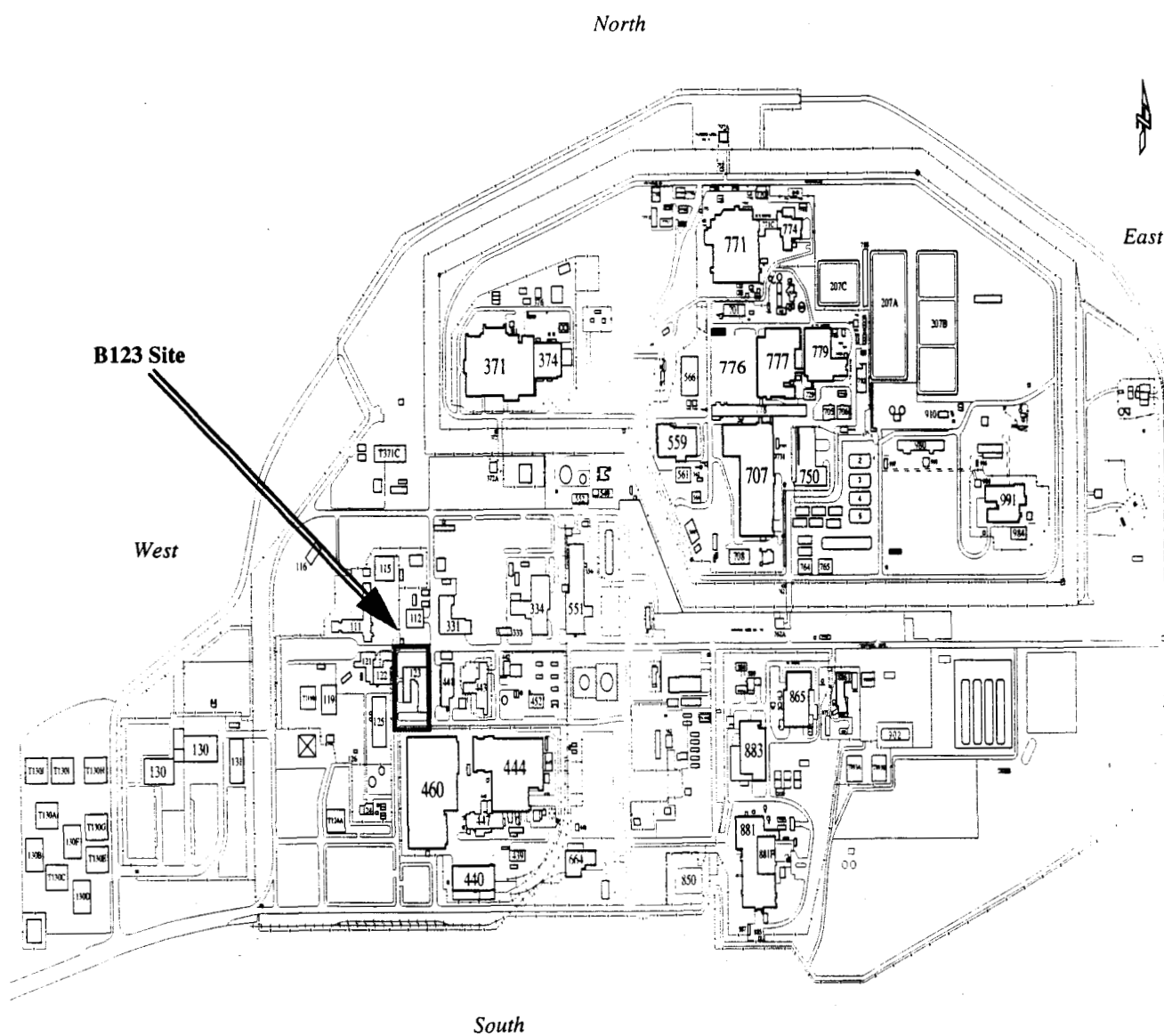
No task will be performed in support of this project until an Activity Hazard Analysis (AHA) (Reference Appendix A) has been written and approved that addresses the task or activity. The AHA will identify the principal steps involved and the sequence of work activities, the potential safety and health hazards associated with each step, the specific controls associated with each potential hazard, the task specific special equipment to be used in performing the activity, and monitoring requirements.

#### **1.2 LOCATION**

Building 123 is located in the RFETS industrial area at the east central portion of the Site as displayed on Figure 1-1, Site Map. It sits in the area enclosed by the intersections of Central and Cottonwood Avenues with Third and Fourth Streets.

### **1.3 PHYSICAL LAYOUT AND DIMENSIONS**

The Building is a u-shaped structure with the front portion facing north along Central Avenue. Its east wing runs parallel to Fourth Street and its west wing runs parallel to Third Street. The plan view of the building is shown in Figure 1-2, Plan View of Building 123. It is a single story, concrete masonry unit structure enclosing an area of 19,000 square feet. The front of the building is 150 feet long; the east wing is 200 feet long, and the west wing is 145 feet long. The north and west sections are 40 feet wide and the east wing is 50 feet wide. The average height of the roof, above ground level, is approximately 20 feet.



**Figure 1-1 RFETS Site Map**

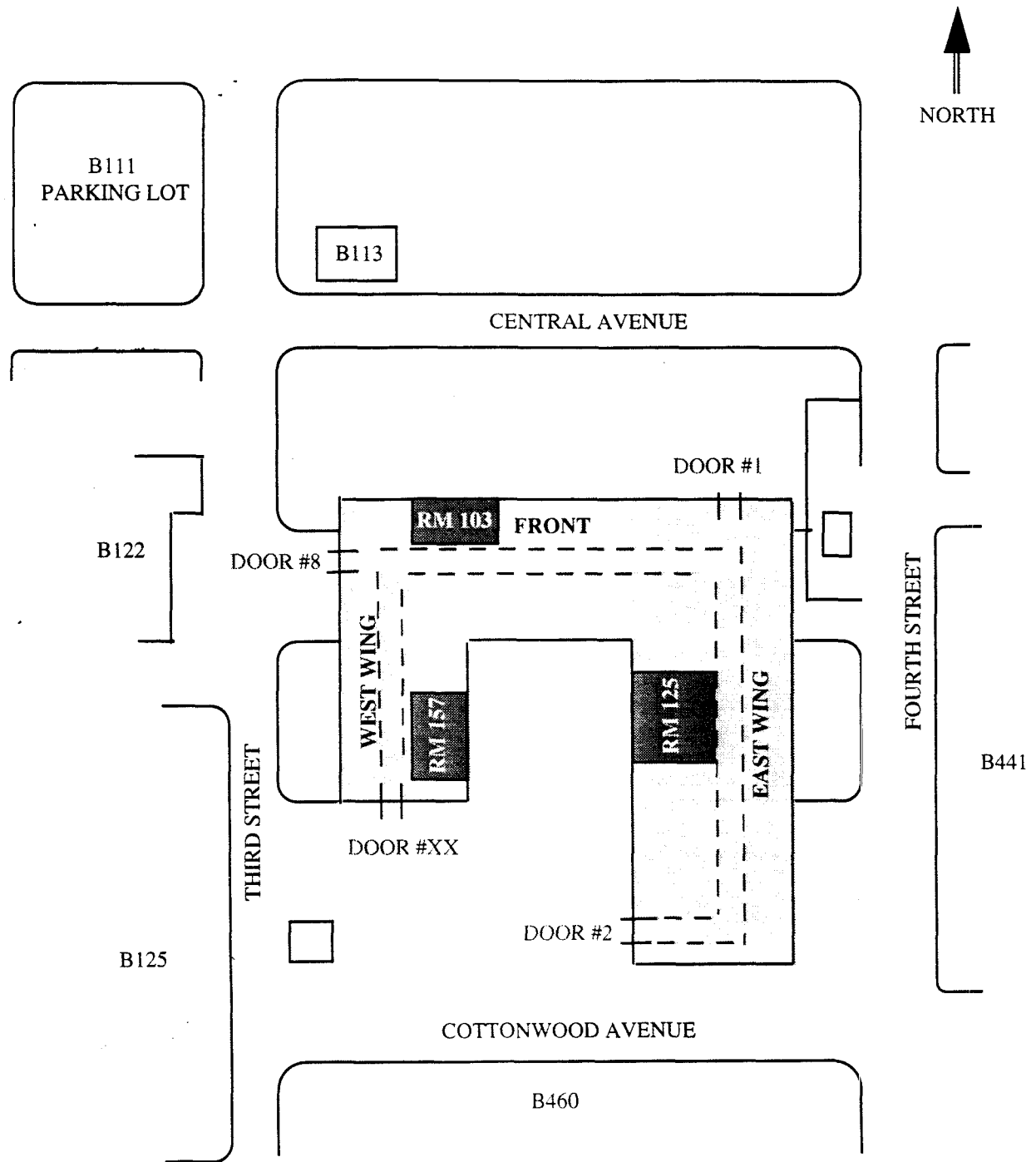


Figure 1-2 Plan View of Building 123

Corridors run through the middle of the front structure and each wing. Laboratories and offices are located on either side of the corridors.

#### 1.4 OPERATIONAL HISTORY

The original structure consisted of the building along Central Avenue and Fourth Street. It was built in 1952. The west wing was added in 1972 and the computer room was built in 1974. The facility has always been used as a bioassay laboratory and a dosimetry counting and distribution facility. It also contained offices for radiation health specialists, storage of all radiological health records, a laboratory for calibration and repair of criticality alarms, and a variety of other repair and calibration shops.

#### 1.5 HEALTH AND SAFETY PROGRAM OBJECTIVES

RMRS is committed to providing a working environment for its employees and its subcontractors that is safe, healthy, productive, and compliant with federal and state laws and regulations. Meeting this commitment will be contingent on RMRS and its subcontractors effectively managing safety and workers who possess the ability and the motivation to identify and mitigate hazards in the workplace. Attaining excellence in execution will require:

**Planning** - preparing a hazard analysis for the workplace and the integration of a formal mechanism of hazard reduction during the early phases and throughout the life cycle of the project.

**Establishing Priorities** - allowing for the appropriate allocation of resources focused primarily on the control of high and moderate probability and consequence hazards.

**Accountability** - establishing meaningful performance metrics to measure progress.

**Enforcement** - understanding that less acceptable safety performance carries a cost and exemplary performance will be rewarded.

The implementation of this philosophy will begin with the subcontractor preparing a project specific safety and health plan which will comply with this document from the implementation phase until the project closeout phase. In conjunction with this, work packages will be written in accordance with the Integrated Work Control Program (IWCP). The sub-contractor will include an AHA for discrete tasks which analyze potential hazards and determine appropriate control measures. The overriding objective of this plan and the supporting subcontractor Health and Safety Plan is to minimize unsafe behaviors and conditions that can result in injuries and noncompliance.

#### 1.6 HEALTH AND SAFETY PLAN DEVELOPMENT

All RMRS subcontractors must implement the following elements when developing their Health and Safety Plan:

- Hold all personnel accountable for implementation of the safety program. This is the only way to aggressively and successfully implement a safety program.
- Establish definitive expectations and objectives for all levels of management, supervision, and craft. This includes performance milestones and encouraging personnel to take an active role in implementation of the health and safety program.

- Secure employee participation. It is imperative to ensure employee buy-in when implementing a safety program. Engaging workers and securing their buy-in is critical to project success. RMRS and subcontractors will encourage full participation in the safety program. At a minimum, this will include involvement in safety committees, training, and pre-evolution briefings.
- Provide line management with competent and consistent technical support. The subcontractor designated safety representative(s) will serve as the safety technical representative and advisor for line management and supervision. Implies with this role is the assurance that the safety representative develop and maintain an close working relationship with supervision to ensure a detailed understanding of the job task and the subsequent health and safety requirements.

**Pre-construction preliminary hazard analysis (PHA)** - The PHA will identify project hazards early in the planning stages of the project. This analysis ensures that the subcontractor has determined the major phases and hazards of the project and evaluated preliminary mitigating measures. At a minimum, this preliminary hazard analysis will include:

1. The anticipated construction phases involved in the project.
2. The types of hazards associated with each anticipated construction phase including safety and health control measures necessary to protect employees and others at the construction project or activity.
3. Drawings and/or other documentation for protective measures, DOE Orders, OSHA standards, Site HSPs or subcontractor specification documents.

## 1.7 SAFETY PLAN KEY ELEMENTS

As the subcontractor develops their health and safety plan, certain key elements must be considered. The subcontractor shall review the applicable federal, state, and site-specific safety documents prior to developing their project specific health and safety plan. At a minimum, the following project related references shall be reviewed:

- DOE Order 5480.9A, "Construction Project Safety and Health Management"
- DOE Order 440.1, "Worker Protection Management for DOE Contractor Employees"
- *RFETS Health and Safety Practices Manual*
- *DOE Handbook for Occupational Health and Safety during Hazardous Waste Activities*
- 29 CFR Part 1926, *Safety and Health Regulations for General Industry*
- Site Procedure 1-C18-HSP-24.01, *Construction Health and Safety Requirements*
- Section 01700, *Subcontractor Safety and Health Requirements*

At a minimum, the subcontractor shall utilize the following outline when developing a Health and Safety Plan:

### Introduction

Construction Project Overview  
Scope of Work Summary  
Specific Task Description

### **Subcontractor Project Organization and Responsibilities**

- Project Manager
- Site Superintendent
- Site Safety and Health Orientation
- Project Personnel
- Subcontractor EH&S Manager
- Contractor Construction Coordinator

### **Orientation and Training**

- Site Specific Safety and Health Orientation
- Safety and Health Training Requirements
- Employee Task Training
- Worksite Access Training (as required)

### **Personal Protective Equipment (PPE)**

- Site Specific PPE Requirements

### **Exposure Monitoring**

- Environmental Monitoring
- Noise Monitoring

### **Medical Surveillance (as required)**

### **Hazard Analysis**

- Preliminary Hazard Analysis
- Activity Hazard Analysis
- Daily Jobsite Hazards/Deficiencies Inspections
- Weekly Formal Jobsite Safety and Health Inspections
- Accident/Incident Investigations Lessons Learned

### **General Safety Requirements**

### **Control of Construction Site Access**

### **Construction Project Bulletin Board**

- Required Postings
- Emergency Numbers

### **Sanitation**

- Potable Water
- Portalets
- Showers/Washing Stations (as required)

## **Emergency Response**

- Employee Injury or Illness
- Emergency Equipment
- Emergency Evacuation
- Unusual Conditions
- Accident/Incident Reporting

## **Spill Control**

- Chemical Spills

## **Recordkeeping Requirements**

- Orientation and Training
- Weekly Safety Meetings
- General
- Injury and Illness
- Medical Records

## **Post Construction Activities**

## **Signature and Approval Page**

## **Required Appendices or Tables**

### **1.8 SUBCONTRACTOR AND THIRD-TIER WORK**

If the RMRS prime subcontractor elects to utilize subcontractors to perform any designated work task, the prime subcontractor is obligated to inform each subcontractor of all health and safety hazards which may be related to any work performed under their contract. As a means of meeting this obligation, RMRS and/or the prime subcontractor project management will make available to each lower-tier subcontractor a copy of this program and any supporting health and safety plans. With RMRS and prime subcontractor approvals, subcontractors will be required to develop their own health and safety plans.

### **1.9 PROGRAM AVAILABILITY**

A copy of the prime subcontractor health and safety plan will be available at each project field location. The Health and safety plan will also be available upon request to all employees, subcontractor representatives, union representatives, and regulatory agencies having authority over the project.

### **1.10 COMPETENT PERSON**

The prime subcontractor and its subcontractors must ensure that they have an OSHA defined competent person onsite. This person must be must identified by name in the subcontractor HASP and be at the job site the entire time the activity requiring a competent person is being performed. Competent persons cannot be changed without the Project Manager's written approval. Additionally, the subcontractor must provide a full-time safety professional. this person and shall be approved in writing by the RMRS Project Manager.

OSHA defines a competent person as someone who, by reason of education, training and experience: is capable of identifying existing and predictable hazards in the work area; conditions which are unsanitary, hazardous, or dangerous to employees; and who has authorization to take prompt and corrective measures to eliminate them.



OSHA construction standards that require a competent person include but is not limited to:

|  |                              |
|--|------------------------------|
| Accident Prevention Responsibility             | Asbestos                     |
| Compressed Air                                 | Cranes, Derricks, and Hoists |
| Electrical                                     | Excavation and Trenching     |
| Fall Protection                                | Ionizing Radiation           |
| Hearing Protection                             | Lead                         |
| Ladders  | Respiratory Protection       |
| Requirements for Lift Slab Operations          | Scaffolding                  |
| Slings   | Welding and Cutting          |
| Underground Construction Demolition Operations |                              |

## **2.0 PROJECT DESCRIPTION**

### **2.1 GOALS**

The goal of this project is to safely remove the above-ground structure, to minimize the generation of waste, and to decommission Building 123 as specified in the Rocky Flats Cleanup Agreement (RFCA). This is in keeping with the ten year plan and is the interim action of the 125/441 Cluster decommissioning effort. The Work Breakdown Structure (WBS) element that will be completed as a result of this effort is 1.1.5.02.04.03.

### **2.2 PREREQUISITES BY OTHERS**

The tasks that are assumed to be completed prior to the start of the decommissioning project and are not considered part of the project are described below:

- Move tenants, furniture, and unattached, non-contaminated equipment out of the building.
- Collect all excess hazardous materials and transfer to subcontractor.
- Move all classified documents and materials.

### **2.3 DECOMMISSIONING SCOPE**

Scope and basis of the estimate at Level 7 of the WBS is discussed below :

- Planning and Engineering - Preparation of the performance cost, schedule, and technical performance baselines and the development of the Integrated Work Control Program (IWCP) packages for all decommissioning work.
- Characterization - Radiological Characterization will require about 20 measurements per room (60 rooms). Hazardous material characterization is required. Asbestos abatement is also required.
- Site Preparation - Site preparation includes relocation of building occupants, asbestos identification and removal, and relocation of the Local Area Network (LAN) line.

- Decontamination - Preliminary investigations indicate that the building should contain no contamination above background levels. However, appropriate monitoring will be conducted during decommissioning activities to verify expected contaminant levels.
- Dismantlement - Piping or exhaust systems within the building will be dismantled prior to building demolition should characterization reveal levels of contamination which would render general demolition impractical. Otherwise, the systems will be demolished with the rest of the building. Systems that will be investigated are exhaust hoods and duct work and the overhead process waste system.
- Demolition - The building will be demolished using methods very similar to those utilized on Building 889. Mobile demolition equipment, typically consisting of an excavator equipped with a shear and/or bucket, bucket loaders and dump trucks will be required. Salvageable metal material will be separated from the demolition rubble. Consideration will be given to stock piling the concrete rubble for reuse as material for the environmental cap for other environmental construction as a cost savings effort.
- Support Services - This element provides for procurement, security environmental, maintenance, and building operations support required to execute the project. It also includes time spent by personnel to accomplish medical and training requirements. Expendable supplies, personal protective equipment, and small tools for project execution are provided by this element.

### **3.0 ORGANIZATION/HEALTH AND SAFETY RESPONSIBILITIES**

#### **3.1 PROJECT MANAGER**

The Project Manager is responsible for overall management and compliance with federal, state, and local health and safety requirements and RMRS and its subcontractor's policies, plans and procedures for this project. The Project Manager must ensure that adequate resources are available to provide a safe workplace for all project personnel.

#### **3.2 DECOMMISSIONING CONSTRUCTION SUPERINTENDENT**

The Decommissioning Construction Superintendent is responsible for implementation and compliance with all applicable health and safety requirements including this HASP. The Construction Superintendent or designee is responsible for reviewing and approving all AHAs.

#### **3.3 ENVIRONMENTAL, SAFETY, HEALTH AND QUALITY (ESH&Q) ORGANIZATION**

ESH&Q Director - is responsible to assign a project Health and Safety Representative or designee.

Project Health and Safety Officer - shall review and approve all AHAs. Shall provide field safety oversight during the project. Shall assist the project manager in any safety investigations.

Industrial Hygiene & Safety (IH&S) Lead (or designee) - is responsible for verifying compliance with all applicable safety and health requirements, and coordinating all required health and safety monitoring and sampling. The IH&S lead or designee is responsible for the development of the HASP, assisting with development of AHAs and providing technical guidance with respect to all applicable health and safety requirements.

### **3.4 RADIOLOGICAL CONTROL ORGANIZATION**

Radiological Control Manager - is responsible for the overall implementation of the Site radiological control program.

Radiological Operations Foreman - provides supervision of Radiological Control Technicians (RCTs) and ensure compliance with the Radiological Work Permit (RWP) and Applicable procedures. Implements and ensures completion of Radiological Surveys, as required to support the project's schedule.

RCTs - provide radiological monitoring for personnel exposure hazards. Performs pre-job and other radiological surveys. Ensures compliance to the RWP and ensures appropriate actions are taken in response to radiological emergencies or contamination events.

Radiological Engineering - defines the engineering, administrative, and work activity controls for identified radiological hazards. Defines PPE requirements for radiological hazards. Defines requirements for the release of property or materials according to HSP 18.10 and Radiological Operating Instruction 3.02.

### **3.5 CRAFT FOREMAN/FIELD ENGINEER**

Supervise the activities of craft personnel. Conducts pre-evaluation job briefings, assist in AHA development, briefings, and performs/assists in site-specific HASP training as necessary.

### **3.6 SITE WORKERS**

Comply with HASP, AHAs, and applicable RFETS practices, procedures, and policies. Reports any accidents, injuries, or near misses immediately to the Craft Foreman/Field Engineer. Assists with development of AHAs. Assure all training required is current.

### **3.7 VISITORS**

Visitors entering the work area during field activities will receive a briefing on the requirements of this HASP. In addition, visitors must have received General Employee Radiological Training, wear dosimetry and other PPE, as required by the RWP, HASP, and AHAs. Normally, visitors will not perform hands on work activities. Training for visitors shall be commensurate with the areas being visited and meet the requirements of the Site RCM, Article 622 or 657.

Visitors who enter any area where they may be exposed to hazards must be trained on the requirements of this HASP. Visitors who enter the work area or sign in under the RWP, who do not meet the minimum training requirements shall not be permitted to perform hands-on work and must be escorted by a site worker who meets minimum training requirements.

## **4.0 HEALTH AND SAFETY HAZARD ASSESSMENT**

### **4.1 POTENTIAL HEALTH AND SAFETY HAZARDS**

During the initial planning stages for the Decontamination and Decommissioning (D&D) of 123, a Job Hazard Analysis Overview (JHA) was conducted in accordance with Site Procedure 1-C18-HSP-24.01 to evaluate the potential health and safety hazards for the project (Reference Table 4-1 to review this analysis).

This JHA will include an evaluation of the types of hazards associated with each phase of the project. Potential health hazards could include: lead, asbestos, radioactive materials, acids, or other hazardous materials, and/or chemicals. Other potential hazards may include: hoisting and rigging, scaffolding usage, lockout/ tagout concerns, fall protection issues and confined space entries. Due to the potential hazardous materials and chemical exposure to the workers, characterization of asbestos, lead, acids, polychlorinated biphenyls (PCBs), uranium, plutonium, and radioactive contaminants will be accomplished in accordance with approved Building 123 Reconnaissance Level Characterization (RLC) survey plans and site procedures. Examples of some of the hazards in the facility are:

1. Asbestos Containing Material in floor, wall board and pipe insulation.
2. Chemicals, acids, and solvents in various laboratories.

Additionally, characterization for presently unidentified hazards will be performed as they are identified.

#### **4.2 PROTECTIVE CONTROL MEASURES**

Control methods will be specified for all identified hazards for each principal step listed in the AHA. These control methods could include engineering controls, administrative controls, and PPE.

**Table 4-1 Preliminary Hazard Analysis Overview**

**BUILDING 123 DISMANTLEMENT AND DECOMMISSIONING  
PLANNING PHASE**

| Major Work Task   | Hazard  | Cause  | Preventative Measures   |
|---|---|--|---|
| Perform building walkdowns to identify IWCP work steps.   | Tripping, falling , noise hazards, exposure to chemicals, hazardous substances and/or radioactive materials . | No planning, lack of communication, improper use of RWPs, not following room or building instructions.   | <ul style="list-style-type: none"> <li>• Develop AHA's.</li> <li>• Conduct pre-evolution briefings.</li> <li>• Follow all building instructions.</li> <li>• Ensure all personnel have been properly trained before entry.</li> </ul>  |
| Move office equipment and furniture to prepare for D&D activities.  | Back strains, pinch points, extremity injuries due to falling objects or moving vehicles.                     | Improper lifting of equipment, careless handling of equipment, improper planning and walkdowns, no continuing observations or use of the buddy system.   | <ul style="list-style-type: none"> <li>• Proper training.</li> <li>• Use of the buddy system.</li> <li>• Proper use of forklifts and trucks including operating alarm systems and brakes.</li> <li>• Planning meetings and briefings.</li> <li>• Proper use of AHA and PPE.</li> </ul>  |
| Perform hazard analysis characterization activities, including asbestos, beryllium, chemical, lead and radiological sampling. | Overexposure to substances, absorption into skin , eye and skin irritation.                                   | Improperly or not using prescribed PPE, lack of proper planning, not following sampling procedures correctly, improper transport or handling of samples. | <ul style="list-style-type: none"> <li>• Prepare and implement AHA for job task.</li> <li>• Wear prescribed PPE.</li> <li>• Conduct planning meetings and briefings.</li> <li>• Follow all building instructions for sampling.</li> <li>• Utilize all procedures and sampling protocols properly.</li> <li>• Ensure all sampling personnel are in the proper medical surveillance programs</li> <li>• Ensure all required training has been completed.</li> </ul> |

### ABATEMENT PHASE - ASBESTOS / LEAD

| Major Work Task                                     | Hazard  | Cause   | Preventive Measures   |
|---|---|---|---|
| Perform asbestos abatement and clean-up activities. | Exposure to asbestos airborne and surface contamination fibers. | Improper clean-up techniques including: improper tent , decontamination or PPE usage. Improper ventilation usage, improper waste handling/disposal. | <ul style="list-style-type: none"><li>• Use certified state abatement inspector to plan and supervise the abatement project.</li><li>• Ensure all workers are trained as asbestos workers</li><li>• Ensure all RFETS asbestos/lead prerequisites are met prior to job commencing.</li><li>• Develop and implement an AHA(s) for the job.</li><li>• Ensure all medical, training and PPE prerequisites are met.</li><li>• Ensure proper air monitoring is performed during the course of the job by IH&amp;S personnel.</li><li>• Ensure all posting and clearance sampling is performed .</li></ul> |
| Work with lead containing materials.                | Exposure to lead materials.                                     |   |   |

### ABATEMENT PHASE - RADIOLOGICAL

| Major Work Task                                  | Hazard   | Cause   | Preventative Measures  |
|--|--|---|--|
| Perform radiological decontamination operations. | Exposure to radioactive materials internally and externally. Cell damage and damage to internal body organs can occur with over exposures to radioactive materials. Improper use of scabbling or other decontamination equipment can injure extremity or other limbs of workers by causing gash or cutting wounds. | Improper clean-up techniques including: Improper tent , decontamination or PPE usage. Improper ventilation usage. Improper waste disposal and handling. Improper training in the proper use of decontamination equipment. | <ul style="list-style-type: none"><li>• Ensure all workers are trained as rad workers</li><li>• Ensure all RFETS rad prerequisites are met prior to job commencing.</li><li>• Develop and implement an AHA(s) for the job.</li><li>• Ensure all medical, equipment training and PPE requirements are met.</li><li>• Ensure the proper air and smear monitoring sampling is performed.</li><li>• Follow the Radiation Work Permit instructions.</li></ul> |

## DISMANTLEMENT & DECOMMISSIONING PHASE

| Major Work Task  | Hazard   | Cause  | Preventative Measures  |
|--|--|--|--|
| De-energize work areas and remove cables and wiring.                             | Electrical shock to body, cutting of extremities or body parts using wire strippers or other hand tools, falling off ladder.   | Lockout/tagout not used properly, all workers not informed of lockout/tagout status. Improper use of hand tools, ladders or scaffolding. Improper lighting.  | <ul style="list-style-type: none"> <li>• Utilize lockout and tagout procedures.</li> <li>• Inspect all hand tools before use.</li> <li>• Ensure all workers are trained in ladder, scaffolding and fall protection measures.</li> <li>• Develop and utilize task specific AHAs.</li> <li>• Perform work area walkdown and conduct proper planning meetings and briefings.</li> <li>• Follow all IWCP instructions.</li> <li>• Ensure all worker training is current.</li> </ul>  |
| Move and transport equipment utilizing forklifts, pallet jacks or pickup trucks. | Back injuries, pinching, extremity damage by dropping or falling objects. Internal and external body injuries by vehicle impact. Eye injuries by poking or dust particles in eye. Noise hazards. | Improper lifting techniques, job flow not planned properly, pre-job walkdowns not performed, vehicle alarm systems not working, buddy system not used, lack of attention to detail, worker fatigue or no use or improper use of PPE. | <ul style="list-style-type: none"> <li>• Perform pre-job walkdowns.</li> <li>• Develop AHAs for job.</li> <li>• Use buddy system.</li> <li>• Ensure vehicle alarm and braking systems are working properly.</li> <li>• Utilize PPE properly.</li> <li>• Perform proper lifting techniques.</li> <li>• Ensure proper job flow is used and job is not rushed.</li> <li>• Perform pre-job warm-up exercises before lifting.</li> <li>• Do not attempt to move items that are stacked too high.</li> <li>• Cover all sharp edges.</li> </ul> |



## DISMANTLEMENT & DECOMMISSIONING PHASE (cont'd)

| Major Work Task                                | Hazard   | Cause  | Preventative Measures   |
|--|--|--|---|
| Cut out piping systems in rooms or work areas. | Cutting of body limbs or body parts with mechanical equipment. Piping falling on feet, pinch points of rolling pipe, liquid splashes if piping is not drained, springing of piping into body when cut. | Improper use of mechanical equipment including lack of training for equipment being used, piping not rigged or restrained properly, piping not drained prior to cutting. | <ul style="list-style-type: none"> <li>• Proper training with cutting equipment.</li> <li>• Develop and utilize AHA for job tasks.</li> <li>• Rig and restrain piping properly.</li> <li>• Utilize pipe caps after cutting to keep debris from falling out and cover sharp edges of pipes after cutting.</li> <li>• Ensure piping has been properly taken out of service.</li> <li>• Utilize proper PPE as described in the AHA and RWP.</li> </ul>                         |
| Rig piping and equipment out of rooms.         | Bodily injuries due to falling objects or pinching of workers due to space limitations.  | No rigging plan, improper rigging techniques, improper worker body positioning.  | <ul style="list-style-type: none"> <li>• Develop rigging plan.</li> <li>• Comply with all RFETS standards for rigging.</li> <li>• Develop AHA and implement.</li> <li>• Perform pre-job walkdown and conduct pre-evolution.</li> <li>• Walkdown rigging path - all phases.</li> <li>• Perform pre- and post-job inspections on all rigging equipment.</li> <li>• Ensure all workers are properly trained.</li> <li>• Follow all of the requirements of the IWCP.</li> </ul> |

### DISMANTLEMENT & DECOMMISSIONING PHASE (cont'd)

| Major Work Task   | Hazard  | Cause  | Preventative Measures   |
|---|---|--|---|
| Packaging waste into containers for storage and shipment. | Pinching of extremities on container lids, barrels rolling on feet, back strains, foot injuries as vehicle wheels impact or roll onto extremities, cuts/gashes of hands by tooling. | Improper lifting and handling techniques, wrong tooling used to put lids on containers, pallet jack or forklift ramming into workers, job rushed or not planned properly.    | <ul style="list-style-type: none"> <li>• Develop AHA and implement.</li> <li>• Review lessons learned from previous waste handling operations.</li> <li>• Develop proper tool list before starting job.</li> <li>• Ensure all waste containers are properly staged before starting job.</li> <li>• Ensure all building notifications are made before moving and handling waste.</li> <li>• Follow all RFETS requirements for waste handling and movement.</li> <li>• Follow all IWCP requirements.</li> </ul> |
| Cut out and remove hoods in rooms or work areas.          | Pinch points, foot and hand injuries, cutting of hands/arms, eye and head injuries, burning of skin or extremities.   | Improper use of grinders, no guards on grinders, cramped working conditions, bad lighting, limited vision, breaking of leaded glass, plasma slag burns, improper use of PPE. | <ul style="list-style-type: none"> <li>• Proper training with cutting equipment.</li> <li>• Develop and utilize AHA for job tasks.</li> <li>• Rig and restrain gloveboxes properly.</li> <li>• Utilize pipe caps on piping after cutting.</li> <li>• Ensure gloveboxes have been properly taken out of service before work starts.</li> <li>• Utilize proper PPE as described in the AHA.</li> <li>• Perform tooling inspections before each use.</li> <li>• Follow all IWCP requirements.</li> </ul>         |

### DISMANTLEMENT & DECOMMISSIONING PHASE (cont'd)

| Major Work Task  | Hazard  | Cause  | Preventative Measures  |
|--|---|--|--|
| Construct and utilize scaffolding to perform job tasks.  | Fall hazards, workers struck by failing objects, hand injuries.   | No use of fall protection, improper training, no use of PPE, improper use of tooling, improper rigging and transport of scaffolding pieces, no scaffold inspections, scaffold collapse.  | <ul style="list-style-type: none"> <li>• Proper training for scaffold erection and use.</li> <li>• Fall protection and rigging training.</li> <li>• Proper use of PPE.</li> <li>• Develop AHA.</li> <li>• Perform documented scaffolding inspections.</li> <li>• Ensure all scaffolding is tagged properly.</li> <li>• Ensure all toeboards and side rails are in place.</li> </ul>  |
| Perform decontamination operations using scabbling machines, hand wiping methods or by applying stripcoat decontamination paint. | Extremity injuries by gouging, cutting or impact. Inhalation, ingestion or skin exposure to radioactive materials and ammonia vapors. Electrocuting, falls. | Improper or no training on equipment used for decontamination, improper work area ventilation, improper use of PPE, no job planning. No lockout/tagout of work area, no fall protection. | <ul style="list-style-type: none"> <li>• Conduct mock-up training on decontamination equipment and stripcoat operations.</li> <li>• Develop AHA for job tasks.</li> <li>• Ensure work area is properly ventilated before applying stripcoat.</li> <li>• Ensure lockout/tagout operations have been performed.</li> <li>• Wear prescribed PPE.</li> <li>• Utilize fall protection when required.</li> <li>• Follow all IWCP, AHA and RWP requirements.</li> </ul> |

### DISMANTLEMENT & DECOMMISSIONING PHASE (cont'd)

| Major Work Task                                      | Hazard  | Cause   | Preventative Measures  |
|--|---|---|--|
| Perform final clean-up of building/structure.        | Tripping, falls, head wounds, pinch points, punctures, contusions, skin contamination, inhalation, absorption of radioactive materials. | Housekeeping, falling objects, lack of or improper use of PPE, sharp edges or sharp objects not protected, no fall protection, improper ladder use.                                 | <ul style="list-style-type: none"> <li>• Perform weekly housekeeping inspections.</li> <li>• Utilize fall protection when applicable.</li> <li>• Develop AHA for job task.</li> <li>• Utilize PPE.</li> <li>• Follow all ALARA reviews, AHAs, RWP and IWCP requirements.</li> </ul>  |
| Perform final survey of building.                    | Falls, head wounds, electric shock, abrasions, cuts, pinches.   | No fall protection, improper use of instrumentation, working in tight spaces, tripping hazards, bad housekeeping, improper termination of wiring.                                   | <ul style="list-style-type: none"> <li>• Develop AHA.</li> <li>• Perform pre-job walkdowns.</li> <li>• Utilize fall protection when required.</li> <li>• Complete ladder training as required.</li> <li>• Utilize two-person rule when working in elevated locations.</li> <li>• Procure confined space permits and training when required.</li> <li>• Follow all AHA and RWP requirements.</li> </ul> |
| Perform demolition activities of building/structure. | Body contusions, head injuries, suffocation, fatalities, breathing hazards.   | Wetting of concrete surfaces not utilized, barriers not used properly, thorough inspections of work area not performed prior to demolition activities, lack of attention to detail. | <ul style="list-style-type: none"> <li>• Develop job AHA.</li> <li>• Perform pre-job walkdowns.</li> <li>• Utilize PPE as prescribed by IH&amp;S.</li> <li>• Maintain wetting of debris with fire hoses as demolition occurs.</li> </ul>   |

## **5.0 MONITORING**

The need for chemical hazard monitoring will be determined by the project IH&S Lead or designee. All air sampling and monitoring will be performed in accordance with approved National Institute of Occupational Safety and Health (NIOSH) or Occupational Safety and Health Act (OSHA) sampling methods using either direct reading instrumentation or personal air sampling. All instrumentation used will be calibrated in accordance with factory recommendations.

Monitoring for radiological hazards, as necessary, will be identified in radiological work permits. All radiological monitoring will be performed in accordance with the procedures contained in the Site Health and Safety Practices Manual and the Site RCM.

Where feasible, engineering controls shall be utilized to maintain personnel exposures to hazardous chemicals within the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists (ACGIH) or the permissible exposure limits adopted by OSHA, whichever is more stringent.

Additional monitoring beyond that described in this section may be required by the subcontractor depending on the work methods, equipment, and materials employed by the subcontractor.

### **5.1 NOISE MONITORING**

Sound pressure levels shall be monitored to delineate hearing protection areas. Those areas with stationary sources routinely testing at or above 85 dBA shall be appropriately posted to indicate the noise hazard. Monitoring frequency and sample quantity shall be determined by the Contractor's industrial hygienist. The frequency will be sufficient to adequately monitor areas where workers may be exposed to noise levels in excess of 85 dBA. Suitable hearing protection shall be worn in areas with noise levels greater than 85 dBA.

### **5.2 HEAT STRESS MONITORING**

Monitoring will consist of periodic measurement of worker body temperature and heart rate during periods when work area temperatures exceed 85°F and protective clothing is required for the work activity. Monitoring may also be required for workers engaged in strenuous activities regardless of the protective clothing requirements. Monitoring frequency will be determined by the Contractor's industrial hygienist and will be based on the work area temperature and the type of work being performed. The Subcontractor shall ensure that personnel are made available for routine heat stress monitoring when conditions warrant such monitoring.

### **5.3 CONFINED SPACE MONITORING**

Prior to any confined space entry, a competent individual shall perform the atmospheric monitoring as described on the confined space entry permit to determine if a hazardous atmosphere exists. Typical areas of monitoring include oxygen combustible gas, carbon monoxide, hydrogen sulfide, photoionized substances, and any other toxic atmospheric contaminants that may be present based on information available on previous use of the confined space. If a hazardous atmosphere exists, ventilation or ventilation in conjunction with respiratory upgrade will be required before entry. In no case shall a confined space be entered where the atmosphere exhibits greater than 10% of the lower explosive limit.

#### **5.4 ASBESTOS MONITORING**

Representative personnel and area monitoring for asbestos exposure shall be performed according to the requirements of OSHA 29 CFR 1926.1101 and applicable State of Colorado regulations. In addition, potential exposure to man-made mineral fibers (MMF) above specified action levels shall be monitored to ensure the adequacy of PPE and work practices.

All airborne asbestos or MMF samples shall be collected and analyzed using the NIOSH Method 7400 and analyzed by a laboratory having both current American Industrial Hygiene Association accreditation for asbestos air sample.

#### **5.5 SUBCONTRACTOR POSTING OF MONITOR RESULTS**

Subcontractors shall review monitoring results with employees. Subcontractors shall notify and supply employees with the results of exposure monitoring in accordance with any OSHA standard requiring such written notification. The Subcontractor shall submit to the Contractor in writing the results of personnel, area, and other monitoring performed during the execution of this subcontract within 24 hours of the receipt of results, unless otherwise specified.

#### **6.0 GENERAL SAFETY**

Each Subcontractor and lower-tier Subcontractor is solely responsible for providing a safe workplace for their personnel who will be exposed to various hazards related to work at RFETS. Some of these hazards are addressed in this section, and the Subcontractor shall comply with all applicable requirements listed below. However, the Subcontractor is charged with the responsibility of adding to, or modifying, the requirements of this section to meet the needs of his/her required tasks. The Subcontractor shall obtain Contractor approval for any such additions and modifications and identify them in the AHA, as applicable.

This HASP has been developed to address numerous hazards which exist at RFETS. Depending on the specific nature of a given work activity, the work methods, and the locations of work, some of the hazards and preventive measures described herein may not be applicable to some of the work to be performed.

The Subcontractor shall be responsible for full compliance, including compliance by lower-tier subcontractors, with all applicable sections of 29 CFR 1926, 29 CFR 1910, DOE health and safety regulations, site-specific HSPs, and Contractor requirements identified in this HASP. Where the provisions of the individual Subparts of 29 CFR 1910 OR 1926 require a "competent person", the Subcontractor shall provide a qualified person meeting the specific requirements identified in the OSHA standard.

The Contractor will make inspections under the OSHA format and require corrective actions for all deficiencies discovered. Willful violation, refusal, or failure to abate violations of safety and health standards or rules will be justification for removal of Subcontractor personnel from the site and/or contract termination.

The Contractor reserves the right to invoke the OSHA general duty clause on any operation which, in the opinion of the Contractor, is being conducted in an unsafe manner, even though the infraction is not specifically spelled out in the regulations or this HASP.

## **6.1 HOUSEKEEPING**

Subcontractors shall ensure that all activities consider housekeeping measures that are adequate for the tasks being performed. Maintenance of housekeeping during all construction projects is crucial to minimizing the severity of emergency situations and reducing accident rates.

Subcontractors shall ensure that construction projects incorporate housekeeping practices in accordance with the following health and safety documents:

- 29 CFR 1926.25, Housekeeping
- Site Procedure 1-622-HSP-13.08, Housekeeping and Sanitation

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that waste is cleared from work areas at regular intervals during the course of construction activities. At all times, passageways shall be kept clear so that in the event of an emergency, egress routes are not obstructed. Waste shall be appropriately contained and dispositioned based on the hazards of the material. Work areas shall be kept clean and floors dry to the extent that the work allows.

## **6.2 ILLUMINATION**

Subcontractors shall ensure that all areas where work is performed are adequately illuminated. Construction activities must be conducted in accordance with the following health and safety documents:

- 29 CFR Part 1926.26, Illumination
- 29 CFR Part 1926.56, Illumination

At a minimum, subcontractors are responsible for the applicable requirements set forth in these documents. This includes ensuring that construction areas, aisles, ramps, runways, corridors, offices, shops, and storage areas where work is in progress are lighted to not less than the minimal illumination intensities listed in Table D-3 of 29 CFR 1926.56 while any work is in progress.

## **6.3 SITE SANITATION**

Acceptable sanitation practices shall be recognized for all site construction activities. Providing a sanitary workplace is essential to ensuring the well-being of all contract employees.

Subcontractors shall ensure that construction projects incorporate sanitation practices in accordance with the following health and safety documents:

- 29 CFR Part 1926.51, Sanitation
- Site Procedure 1-622-HSP-13.08, Housekeeping and Sanitation

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that a source of potable water, lavatories, and toilets are supplied at each place of employment. Also, all sources of nonpotable water shall be marked as such. Change rooms shall be provided in areas where employees are required to wear protective clothing due to the possibility of contamination with toxic materials.

## 6.4 HAZARD COMMUNICATION

Subcontractors shall ensure that all construction personnel are effectively informed of the hazards they are exposed to, or potentially exposed to, in the workplace. Construction personnel must also be informed of the methods available to prevent exposure. Subcontractors shall ensure that hazard communication (HAZCOM) requirements are implemented at each location in accordance with the following health and safety documents:

- 29 CFR Part 1926.59, Hazard Communication
- HSP 9.07, Hazard Communication Program

At a minimum, subcontractors are responsible for the applicable requirements set forth in these documents. This includes developing a written hazard communication program for each site, as necessary, and providing appropriate training to personnel. The written HAZCOM Program must discuss how labels and material safety data sheets (MSDS) can be used to protect personnel against workplace hazards. Training must ensure the workers understand the information on both labels and MSDSs, know how to access this information when needed, and are aware of the proper protective procedures to follow. Implementation of the HAZCOM Program will ensure that all personnel have knowledge of the hazards and identities of the chemicals they work with, and will reduce the incidence of chemically related occupational illnesses and injuries.

## 6.5 FIRE PROTECTION AND PREVENTION

Subcontractors shall be responsible for the development of a fire protection program to be followed throughout all phases of construction and demolition work. It is critical that all fire protection and prevention precautions be strictly complied with to minimize fire potential. Subcontractors must ensure that the applicable fire safety measures are complied within accordance with the following regulatory reference:

- 29 CFR Part 1926.150-159 (Subpart F), Fire Protection and Prevention

at a minimum, subcontractors are responsible for the applicable requirements set forth in this document. This includes developing and implementing a fire protection program that will be used through all phases of the project. The subcontractor must provide an adequate water supply, portable fire extinguishers, or other method of fire suppression at appropriate locations in accordance with applicable regulatory requirements. When work on elevated work platforms (scaffolds) includes the use of festoon or halogen lighting systems, or any other potential source of ignition, portable fire extinguishers must be readily accessible for worker protection. All fire suppression equipment shall be maintained and inspected to ensure it will operate when needed. Subcontractor personnel shall be trained in the use of portable fire extinguishers in accordance with the applicable OSHA requirements. Certification of training shall be provided to the contractor prior to commencement of work activities.

Subcontractors shall ensure that electrical wiring and equipment used for light, heat, or power purposes is installed in compliance with the electrical requirement of Subpart K of 29 CFR 1926. Internal combustion engines used to power equipment shall be located so that the exhausts are well away from combustible materials. Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard. Fire hazard areas shall be conspicuously posted: "No smoking or Open Flame." Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for hazardous conditions. Subcontractors must ensure that the nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.



## **6.6 FLAMMABLE AND COMBUSTIBLE LIQUIDS**

Subcontractors shall ensure that flammable and combustible liquids used during construction activities are properly stored, transferred, dispensed, and handled. The use of recognized safety practices for flammable and combustible liquids is crucial to minimizing potential fire hazards. Subcontractors must manage flammable and combustible liquids in accordance with the following regulatory reference:

- 29 CFR Part 1926.152, Flammable and Combustible Liquids

At a minimum, subcontractors are responsible for the applicable requirements set forth in this document. This includes using only approved containers and portable tanks for the storage and handling of flammable and combustible liquids. Containers and tanks used for the storage of such materials shall be appropriately labeled. Storage locations for flammable and combustible liquids shall be chosen considering all elements necessary for the safe storage of such materials.

## **6.7 CONFINED SPACES**

Subcontractors shall ensure that the applicable requirements are followed to protect personnel from the hazards of entry into confined spaces. Subcontractors shall evaluate each workplace to determine if any spaces fit the definition of a permit-required confined space. Permit-required confined spaces shall be managed in accordance with the following regulatory reference:

- 29 CFR 1910.146, Permit-Required Confined Spaces

At a minimum, subcontractors are responsible for the applicable requirements set forth in this document. This includes developing a permit space program if it is determined that the workplace contains permit-required confined spaces that will be entered by employees. Subcontractors shall develop a written program to prevent unauthorized entry; identify and evaluate hazards, and establish procedures and practices for safe entry, including testing and monitoring conditions; stationing attendants outside permit spaces during entry times; and posting procedures to summon rescuers and preventing unauthorized personnel from attempting a rescue. The permit space program shall ensure that supervisors authorize entry to confined spaces, prepare and sign permits, order corrective measures when necessary, and cancel permits when the work is completed.

## **6.8 LOCKOUT/TAGOUT**

Subcontractors shall ensure that the required procedures are followed for lockout/tagout of equipment to ensure the protection of personnel, the environment, and equipment due to unexpected energization, start-up, release of stored energy or release of hazardous materials from equipment. The use of required lockout/tagout procedures is essential to providing personnel with a safe workplace and minimizing occupational injuries. Subcontractors must ensure that lockout/tagout precautions are used in accordance with the following health and safety documents:

- 29 CFR Part 1910.147, The Control of Hazardous Energy (Lockout/Tagout)
- 29 CFR Part 1926.417, Lockout and Tagging of Circuits
- HSP 2.08, Lockout/Tagout

At a minimum, subcontractors are responsible for the applicable requirements set forth in these documents. This includes training employees to recognize hazardous energy sources, the type and magnitude of energy sources found in the workplace, the means and methods of isolating and/or controlling energy, the means of verification of effective energy control, and the purpose of the procedures to be used. The subcontractor shall ensure that lockout/tagout procedures are used when required and that lockout/tagout permits are completed by a competent person in accordance with the applicable requirements.

In situations where RMRS de-energizes a system, the subcontractor must also put their lock or tag on the system. Each subcontractor is required to develop a procedure by which this may be accomplished.

## **6.9 MATERIAL HANDLING**

Subcontractors shall ensure that all materials used or produced during construction activities are properly stored, used, or disposed. Handling of all materials shall be in accordance with safe and acceptable work practices. Subcontractors shall ensure that material handling is conducted in accordance with the following health and safety documents:

- 29 CFR Part 1926.250 - 252 (Subpart H), Material Handling, Storage, Use, and Disposal
- 29 CFR Part 1926.602, Material Handling Equipment
- 29 CFR Part 1926.953, Material Handling

*VA*  
In the event that a waste stream is identified that is not listed in this Health and Safety Plan, and the waste stream identified has the potential of impacting human health or the environment, then RMRS or its subcontractors is required to immediately notify Kaiser-Hill Environmental Management and Compliance Division of the existences of the waste stream. Jointly RMRS and Kaiser-Hill will determine the most appropriate management and disposal options for this waste stream.

At a minimum, subcontractors are responsible for the applicable requirements set forth in these documents. This includes ensuring that all materials stored in tiers are stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse. Maximum safe load limits of floors within buildings and structures shall be conspicuously posted in all storage areas, except for floor or slab on grade. Subcontractors shall ensure that aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

## **6.10 HAND AND POWER TOOLS**

Subcontractors shall ensure that employees utilize hand and portable power tools that are maintained in serviceable condition and free from hazards. Subcontractors are responsible for instructing employees in the safe use and inspection of tools utilized as part of their job. Subcontractors must ensure that hand and power tools are used in accordance with the following health and safety documents:

- 29 CFR Part 1926.300 - 307 (Subpart I), Tools - Hand and Power
- HSP 12.10, Hand and Portable Power Tools

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that tools are properly guarded, that employees are provided with the proper PPE, and that tools are equipped with proper "on-off" control switches. Subcontractors shall not issue or permit the use of unsafe power or hand tools.

## **6.11 WELDING, CUTTING, AND BRAZING**

Subcontractors shall ensure that welding, cutting, and brazing activities performed during construction activities are conducted in accordance with acceptable safe work practices. Welding, brazing, and cutting shall only be performed in authorized areas under safe environmental conditions with adequate ventilation. Subcontractors must manage construction projects in accordance with the following health and safety documents:

- 29 CFR Part 1926.57, Ventilation
- 29 CFR Part 1926.350 - 354 (Subpart J), Welding and Cutting
- HSP 12.11, Welding, Cutting, and Brazing
- HSP 31.10, Welding Permits

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that appropriate personnel receive training adequate for their job responsibilities. When practical, welding, cutting, or brazing operations shall be conducted in a permanent welding area unless the object to be welded or cut cannot be readily moved. When possible, ventilation shall be used in an effort to minimize respiratory hazards. Personnel shall use PPE appropriate for the task they are performing. Welding permits shall be used, when required, to review a job for possible safety, fire, and explosion hazards, and to identify the necessary precautions for the safety and health of personnel and for the protection of property.

## **6.12 ELECTRICAL**

Subcontractors shall address electrical safety requirements necessary for the safeguarding of employees involved in construction work. Subcontractors shall ensure that only trained and qualified electrical workers are assigned to perform work on electrical equipment, components, and systems. Subcontractors must ensure that the proper electrical safety requirements are used in accordance with the following health and safety documents:

- 29 CFR Part 1926.400 - 449 (Subpart K), Electrical
- HSP 15.00, Electrical Safety Practices
- Site Procedure 1-C18-HSP-24.01, Construction Safety and Health Requirements

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that all personnel receive electrical training adequate for their job responsibilities. Subcontractors will ensure that personnel who install, repair, or remove electrical equipment are informed of site-specific hazards so that they may follow special precautions to prevent environmental and personnel contamination. Electrical equipment and circuits shall be considered energized unless they are positively determined to be de-energized by a qualified electrical worker. Physical safety barriers, warning signs, and labels must be used in accordance with regulatory requirements and site procedures. Portable electrical tools, equipment, and cords must be of satisfactory condition so that they do not cause harm to personnel or property.

### 6.13 SCAFFOLDS

Subcontractors shall ensure that scaffolds are furnished and used in accordance with applicable OSHA regulations for persons engaged in work that cannot be done safely from the ground or from solid construction. Subcontractors shall ensure that scaffolds and associated equipment are properly erected and maintained to ensure the safety of subcontract personnel. The use of scaffolding must be conducted in accordance with the following regulatory reference:

- 29 CFR Part 1926.450 - 454 and appendices (Subpart L), Scaffolds

At a minimum, subcontractors are responsible for the applicable requirements set forth in this document. This includes ensuring proper scaffold construction and use. Scaffolds shall be designed by a qualified and competent person and constructed and loaded in accordance with that design. Training and qualifications of the competent scaffold erection supervisor shall be provided to the contractor prior to commencement of work activities. Personnel involved in erecting, disassembling or moving scaffolding shall be trained in accordance with 29 CFR 1926.454. Training records shall be provided to the contractor prior to commencement of work activities.

Fall protection shall be provided to workers during erection and dismantling activities involving 10 feet or more and/or two or more sections of scaffolding. Permits shall be attached to each scaffolding system. Permits shall be in the form of weather resistant tags. Scaffolding systems shall be inspected and the permit shall be signed off on a daily basis by a competent scaffold erection supervisor. Scaffolds shall be marked with a green tag if it meets all safety requirements as stipulated under OSHA regulations. Scaffolds shall be marked with a red tag if it does not meet all safety requirements. Safety requirements for use of an incomplete scaffold shall be specified on the permit.

Scaffolds four feet or higher above the ground or floor and having a minimum horizontal dimension of 45 inches in either direction shall be equipped with standard guardrails (including toeboards) and gates. Where guardrails are not feasible, personal fall arrest equipment shall be used. Ladders shall be provided as access to scaffolds. Climbing on scaffolds ends or cross bracing shall not be permitted.

Scaffolds and scaffold components shall not be loaded in excess of their maximum intended loads or rated capacities, whichever is less. Subcontractors shall ensure that scaffolds and scaffold components are inspected by a competent person prior to each work shift, and after any occurrence which could affect a scaffold's structural integrity.

### 6.14 FALL PROTECTION

Subcontractors shall identify fall hazards for each construction task and provide appropriate fall protection equipment to personnel working in an area where a hazard has been identified. Subcontractors must ensure that the requirements for the installation, construction, and proper use of fall protection is in accordance with applicable regulatory requirements and site-specific procedures. Subcontractors must manage construction projects in accordance with the following health and safety documents:

- 29 CFR Part 1926.500 - 503 and appendices (subpart M), Fall Protection
- HSP 22.05, Fall Protection and Equipment

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes conducting pre-job planning to determine the fall potential and appropriate fall protection equipment for each task. Fall protection equipment shall be selected based upon recognized industry standards and OSHA regulations. For areas where fall protection is deemed appropriate, subcontractors must determine environmental hazards at the worksite, designation of anchor points, a means of maintaining contact with personnel during work, and a means of rescue after a fall. All fall protection equipment shall be subjected to a pre-use inspection. Subcontractors shall ensure that fall protection equipment is only used for its intended purpose and in accordance with acceptable safe work practices. All subcontractor employees who might be exposed to fall hazards are required to receive appropriate training to recognize the hazards of falling and procedures to be followed to minimize these hazards.

Where work will be performed from the platform of an incomplete scaffold (no guardrails or toeboards), outside of the boundaries of a scaffold, or from a ladder where the worker's feet are more than six feet above the floor or ground, the worker shall be provided with a personal fall arrest system. At a minimum, personal fall arrest systems shall consist of an approved full body harness, shock absorbing lanyard or retractable lifeline system, and anchorage points which meet or exceeds the requirements specified in 29 CFR 1926.502(d). The personal fall arrest equipment must be rigged such that a worker can neither free fall more than six feet, nor contact any lower level.

The Subcontractor shall utilize 100% fall protection practices. The term "100% fall protection" means the design and use of a fall protection system such that no exposure to an elevated fall hazard occurs. This may require more than one fall protection system or a combination of prevention or protection measures. Definitions are provided in Section 6.14.3 for the terminology used throughout this section. Fall protection is required in areas which include, but are not limited to:

- Any and all elevated work areas.
- Scaffolding.
- Power driven staging and platforms.
- Manbaskets.
- Roofs.
- Excavations.

A full body harness is required for elevated work above six feet. Safety belts will not be permitted unless prior approval is received from the Contractor. All fall protection equipment shall be inspected before use by the user and quarterly by a competent person. Inspection records shall be available to the Contractor upon request.

Vertical lifelines may only be used in conjunction with a manufactured rope-grab system. Wire rope lifelines shall have a minimum of three wire rope clips. Cutting or burning around manilla or nylon lifeline ropes is prohibited.

The Subcontractor shall address the following (where applicable) in the PHA:

- Identify all fall hazards in the work area.
- Describe the method of fall arrest or fall restraint to be provided, including any drawings that may be deemed necessary.

Procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used shall be made available to the Contractor upon request.

#### **6.14.1 Fall Restraint, Fall Arrest Systems**

When employees are exposed to a potential fall hazard of six feet or more in height, the Subcontractor shall ensure that fall restraint and/or fall arrest systems are provided, installed, and implemented according to the following requirements.

##### **Fall Restraint**

Fall restraint protection shall consist of:

- Standard guardrails as described in OSHA 29 CFR 1926.500.
- Safety belts and/or harness attached to securely rigged restraint lines.
  - Safety belts and/or harness shall conform to American National Standards Institute (ANSI) standards:

|           |   |                          |
|-----------|---|--------------------------|
| Class I   | - | body belt                |
| Class II  | - | chest harness            |
| Class III | - | full body harness        |
| Class IV  | - | suspension/position belt |
  - Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer and used in strict accordance with the manufacturer's recommendations and instructions.
  - The Subcontractor shall ensure component compatibility.
  - Components of fall restraint systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.
  - Anchorage points used for fall restraint shall be capable of supporting four times the intended load.
  - Restraint protection shall be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.
- A warning line system as prescribed in OSHA 29 CFR 1926.500. However, warning line systems are prohibited on surfaces exceeding four in 12 pitch.

##### **Fall Arrest**

Fall arrest protection shall consist of:

- Full body harness, shock-absorbing lanyards with double-action locking snap-hooks and/or lifelines.
  - An approved Class III full-body harness shall be used.

- An approved sock-absorbing lanyard or double lanyard shall be used.
  - All components of a full-body harness system subject to impact loading shall be immediately discarded.
  - All safety lines and lanyards shall be protected against being cut or abraded.
  - Full-body harness system shall be rigged to minimize free fall distance with a maximum free fall distance allowed of six feet, and such that the employee will not contact any lower level.
  - The full-body harness system shall be connected to an anchorage point above the shoulders. However, if conditions warrant, the Contractor may approve alternate connection points.
  - When vertical lifelines (drop-lines) are used, not more than one employee shall be attached to any one lifeline.
  - All components of full-body harness systems shall be capable of supporting a minimum dead weight of 5,400 lbs.
  - Snap-hooks shall not be connected to each other.
  - Not more than one snap-hook shall be connected to any one D-ring.
  - Full-body harness systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.
- Safety nets shall not be used in lieu of full-body harnesses.

#### **6.14.2 Guarding of Low-Pitched Roof Perimeters**

##### **General Provision**

During the performance of work on low-pitched roofs with a ground to eave height greater than six feet, the Subcontractor shall ensure that employees engaged in such work be protected from falling from all unprotected sides and edges of the roof as follows:

- By the use of a fall restraint or fall arrest system.
- By the use of a warning line system.
- Mechanical equipment shall be used or stored only in areas where employees are protected by a warning line system, or fall restraint, or fall arrest systems.

##### **Exception**

- The provisions of this section do not apply at points of access such as stairways, ladders and ramps.

##### **Warning Lines Systems**

- Warning lines shall be erected around all sides of the work area.

- When Mechanical equipment is not being used, the warning line shall be erected not less than six feet (1.8 m) from the edge of the roof.
- When mechanical equipment is being used, the warning line shall be erected not less than six feet (1.8 m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.
- The warning line shall consist of a rope, wire, or chain and supporting stanchions erected as follows:
  - The rope, wire or chain shall be flagged at not more than six feet (1.8 m) intervals with high-visibility material.
  - The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is not less than 34 in. (0.86 m) above the roof surface, perpendicular to the warning line, and in the direction of the roof edge.
  - The rope, wire, or chain shall have a minimum tensile strength of 500 lbs. (227 kg).
  - The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
  - A warning line system rope or chain shall be capable of resisting without tipping over, a force of at least 16 lbs. (71 Newtons) applied horizontally against any part of the system.
- Access paths shall be erected as follows:
  - Points of access, materials handling areas, and storage areas shall be connected to the work area by a clear access path formed by two warning lines.
  - When the path to a point of access is not in use, a rope, wire, or chain, equal in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area.

### **Roof Edge Material Handling Areas and Material Storage**

Employees working in a roof edge material handling or material storage areas location on a low-pitched roof with a ground to eave height greater than six feet shall be protected from falling along all unprotected roof sides and edges of the area.

- When guardrails are used at hoisting areas, a minimum of four feet of guardrail shall be erected on each side of the access point through which materials are hoisted.
- A chain or gate shall be placed across the opening between the guardrail sections when hoisting operations are not taking place.



- When guardrails are used at bitumen pipe outlets, a minimum of four feet guardrail shall be erected on each side of the pipe.
- When safety belt/harness systems are used, they shall not be attached to the hoist..
- When fall restraint systems are used, they shall be rigged to allow the movement of employees only as far as the roof edge.
- Materials shall not be sorted within six feet of the roof edge unless guardrails are erected at the roof edge.

### 6.14.3 Fall Protection Definitions

**Anchorage** - A secure point of attachment for lifelines, lanyards, or deceleration devices which is capable of withstanding a dead weight of 5,400 lbs. for each employee.

**Body belt** - A Type 1 safety belt used in conjunction with lanyard or lifeline for fall restraint only.

**Full-Body Harness** - A configuration not connected straps to distribute a fall arresting force over at least the thighs, shoulders, and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

**Competent Person** - An individual knowledgeable of fall protection equipment, including the manufacturers recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

**Continuous Fall Protection** - The design and use of fall protection system such that no exposure to an elevated fall hazard occurs. This may require more than one fall protection system or a combination of prevention or protection measures.

**Deceleration Device** - Any mechanism, such as a rope grab, ripstitch lanyard, specifically woven lanyard and automatic self-retracting lifeline, which serves to dissipate more energy during a fall arrest than does a standard line or strap webbing lanyard.

**Drop Line** - A vertical lifeline secured to an upper anchorage for the purpose of attaching a rope grab device.

**Fall Arrest System** - The use of multiple, approved safety equipment components such as: body harnesses, lanyards, deceleration devices, drop-lines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged as to arrest a free fall.

**Fall Restraint System** - An approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

**Fall Distance** - The actual distance from the worker's support to the level where a fall would stop.

**Horizontal Lifeline** - A rail, rope, wire, or synthetic cable that is installed in a horizontal plane between two anchorages and used for attachment of a worker's lanyard or lifeline device while moving horizontally; used to control dangerous pendulum-like swing falls.

*Lanyard* - A flexible line of webbing, rope, or cable used to secure a body belt or full body harness to a lifeline or an anchorage point usually two feet, four feet or six feet long, which includes double-action, locking snap-hooks and an integral shock-absorber.

*Snap Hook* - A connecting snap hook that requires two separate forces to open the gate: one to deactivate the gatekeeper and a second to depress and open the gate which automatically closes when released; used to minimize roll-out or accidental disengagement.

*Low-Pitched Roof* - A roof having slope equal to or less than four in 12.

*Rope Grab* - A fall arrester that is designed to move up or down a lifeline suspended from a fixed overhead or horizontal anchorage point, or lifeline, to which the belt or harness is attached. In the event of a fall, the rope grab locks onto the lifeline rope through compression to arrest the fall. The use of a rope grab device is restricted for fall restraint applications.

*Self-Retracting Lifeline* - A deceleration device which contains a drum-wound line which may be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which after onset of a fall, automatically locks the drum and arrests the fall.

*Strength Member* - Any component of a fall protection system that could be subject to loading in the event of a fall.

*Waling/Working Surface* - Any area whose dimensions are 45 inches or greater in all directions, through which workers pass or conduct work.

*Warning Line System* - A barrier erected on a walking and working surface or a low-pitch roof (4/12 pitch or less), to warn employees that they are approaching an unprotected fall hazard.

*Work Area* - That portion of a walking/working surface where job duties are being performed.

## **6.15 CRANES AND DERRICKS**

Subcontractors shall comply with all regulatory requirements and manufacturer's specifications and limitations applicable to the operation of cranes and derricks. Cranes and derricks and associated equipment used during construction activities shall not exceed the capacity, rating, or scope recommended by the manufacturer. Subcontractors shall ensure that the use of cranes and derricks is conducted in accordance with the following regulatory reference:

- 29 CFR Part 1926.550, Cranes and Derricks

At a minimum, subcontractors are responsible for the applicable requirements established in this document. This includes ensuring that all machinery is operated and inspected by a competent person. Equipment inspections shall take place prior to each use, during use, to make sure the equipment is in safe operating condition. Subcontractors shall ensure that rated load capacities, recommended operating speeds, and special hazard warnings or instructions are conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while he is at his control station.

## **6.16 MOTOR VEHICLE AND MECHANIZED EQUIPMENT**

Subcontractors shall ensure the safe operation of motor vehicles and mechanized equipment during the course of all onsite construction activities. All motor vehicles and mechanized equipment must be properly maintained to minimize the potential of injury to personnel. Subcontractors shall ensure the appropriate measures are followed in accordance with the following regulatory reference:

- 29 CFR Part 1926.600 - 606 (Subpart O), Motor Vehicles, Mechanized Equipment, and Marine Operations.

At a minimum, subcontractors are responsible for the applicable requirements set forth in this document. This includes ensuring that equipment is properly secured and distinguished with lights, reflectors, or other means, to identify the location of the equipment at night and when not in use. All vehicles shall have brake lights in operable condition regardless of light conditions. Whenever visibility conditions warrant additional light, vehicles shall be equipped with at least two headlights and two taillights in operable condition. All vehicles shall be equipped with an adequate warning device at the operator's station in an operable condition.

## **6.17 EXCAVATIONS**

Subcontractors shall ensure that excavations are conducted using appropriate safety practices. Prior to the commencement of any excavation activities, a site evaluation of the area to be excavated will be performed to identify potential hazards and the necessary precautionary measures. Subcontractors must perform excavation activities in accordance with the following health and safety documents:

- 29 CFR Part 1926.650 - 652 and appendices (Subpart P), Excavations
- 29 CFR Part 1910.146, Permit Required Confined Space
- HSP 6.04, Confined Space Entry Program
- Site Procedure 1-B37-HSP-12.08, Excavations and Trenching
- Site Procedure 1-C18-HSP-24.01, Construction Safety and Health Requirements

At a minimum, subcontractors are responsible for the applicable requirements set forth in these documents. This includes informing trenching and excavation personnel of the necessary requirements to comply with applicable OSHA regulations and site-specific requirements. The subcontractor is responsible for ensuring that daily inspections of excavations, adjacent areas and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective system, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence.

The OSHA standards are very specific with respect to excavations. All personnel shall receive training appropriate for the activities they are required to perform. The term "excavation" applies to any excavation whether by equipment or by hand. The requirements outlined in HSP 12.08 will assist in regulating excavation methods that could cause a personnel safety hazard, damage to a buried or unburied utility or other item, or that could cause a spill. The requirements under this procedure are in addition to, not in lieu of, any AHA or PHA requirements.

A competent person must be present at an excavation greater than four feet in depth at all times while personnel are working in it or when the excavation is deemed critical. Spoil must be threat feet from the excavation, and the excavation must be barricaded at all times. The Subcontractor must maintain a record of excavation inspections, including reinspection of excavations after weather changes extended absence from the excavation, and if continued work in the excavation has taken place for a long period of time.

Access to excavations must be via secured ladders that extend 36 inches above the excavation, have adequate landings at the top and base, and are located within 25 feet of personnel. If the Subcontractor and the Contractor disagree on a soil type, the most conservative approach shall prevail. All trenches, regardless of depth, that contain water or have been previously excavated shall be considered Class "C" soil. If a professional engineer is required to design shoring systems, he or she shall be registered in the State of Colorado.

Fall protection shall be required for excavations with slopes steeper than 1:1 or 45° and depths six feet and greater. Standard guard rails or shoring that extends 42 inches above the ground level can serve as fall restraint. When fall arrest systems such as anchored rope or cable systems are used they should be capable of supporting 5,400 lbs. for each person and shall be rigged to allow the movement of employees only as far as the excavations edge.

## **6.18 DEMOLITION**

Subcontractors shall ensure that adequate safety precautions are used during all demolition activities. The use of safe work practices while performing demolitions is crucial to providing a safe workplace for all personnel. Subcontractors shall ensure that demolition activities are performed in accordance with the following regulatory reference:

- 29 CFR Part 1926.850 - 860 (Subpart T), Demolition

At a minimum, subcontractors are responsible for the applicable requirements set forth in this document. This includes ensuring that the necessary preparatory requirements are followed prior to the start of any demolition activities. Subcontractors shall ensure that before starting demolition operations, an engineering survey is made by a competent person of the structure to determine the condition of the framing, floors, and walls, and possibility of an unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The subcontractor shall have in writing evidence that such a survey has been performed.

Subcontractors must verify that all electric, gas, steam, sewer, and other service lines are shut off, capped, or otherwise controlled, outside the building line before demolition work is started. It is necessary to maintain any power, water or other utilities during demolition, such lines, shall be temporarily relocated, as necessary, and protected. It shall be also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in pipes, tanks or their equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Where hazards exists that employees may potentially fall through wall openings, the opening shall be protected to a height of approximately 42 inches. When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than six feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above. All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load which may be imposed. Such materials shall be properly secured to prevent its accidental movement.

Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story below. Employee entrances to multistory structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of eight feet. All such canopies shall be at least two feet wider than the building entrances or openings (one foot wider on each side thereof), and shall be capable of sustaining a load of 150 pounds per square foot.

## **6.19 ROLLOVER PROTECTIVE STRUCTURES**

Subcontractors shall comply with rollover and overhead protection requirements to minimize the possibility of operator injury resulting from rollover and overhead hazards, such as flying and falling objects, and at the same time to minimize the possibility of operator injury from the cover itself in the event of an accidental upset. Subcontractors must ensure that the proper safety precautions are complied with in accordance with the following regulatory reference:

- 29 CFR Part 1926.1000 - 1003 (Subpart W), Rollover Protective Structures; Overhead Protection

At a minimum, subcontractors are responsible for the applicable requirements established in this document. This includes ensuring that rollover protection structures and supporting attachments meet the minimum performance criteria required by OSHA regulations. Additionally, subcontractors must ensure that overhead protection for industrial tractors shall be designed and installed according to the requirements of the applicable Society of Automotive Engineers, Inc. (SAE) standard.

## **6.20 STAIRWAYS AND LADDERS**

Subcontractors shall ensure that construction activities consider applicable regulatory requirements and site-specific procedures concerning stairways and ladders for all tasks being performed. The proper design, maintenance, and use of ladders and stairways is necessary to minimize workplace hazards. Subcontractors must manage construction projects in accordance with the following health and safety documents:

- 29 CFR Part 1926.1050 - 1060 and appendices (Subpart X), Stairways and Ladders
- Site Procedure 1-C-18-HSP-24.01, Construction Safety and Health Requirements

At a minimum, subcontractors are responsible for the applicable requirements set forth in these documents. This includes providing a training program for employees to recognize hazards related to ladders and stairways and to inform them of procedures to be followed to minimize these hazards. Training records shall be provided to the contractor prior to the commencement of work activities.

Subcontractors shall use ladders to provide safe access to all areas, as necessary. Step ladders, straight ladders, and extension ladders shall be rated 1-A industrial heavy duty, and shall conform to appropriate safety codes (ANSI A-14.1). Aluminum ladders shall not be used in areas where there is potential for contact with energized electrical circuits or equipment. A ladder inspection program shall be developed and utilized for each work site, as necessary.

## **7.0 SITE CONTROL MEASURES**

### **7.1 SITE COMMUNICATIONS**

Project personnel will have access to telephones located in the immediate area. Emergency information will be communicated to building clusters or project work sites by way of the Life Safety/Disaster Warning System (LS/DW).

### **7.2 WORK ZONES**

The project site will be posted as an RMRS work area and access to the area will be limited to those personnel working on the project. Additional work zones required for lead, asbestos, and radiological hazards will be established in accordance with the applicable requirements and will be indicated in the AHAs.

### **7.3 BARRICADES**

Warning barricades shall be properly erected and at least 6 ft. from the identified hazard. The barricades are to be weighted to prevent displacement by wind. Warning barricades located along or in roadways shall be equipped with operating warning lights. Protective barricades shall:

1. Be erected at the point of hazard.
2. Meet the applicable OSHA requirements.
3. Be in good repair.

Approved accident prevention signs shall be used in conjunction with the barricades. Subcontractors shall ensure that workplace hazards are identified by using appropriate signs, signals, and barricades. Identifying workplace hazards will minimize potentially dangerous situations and reduce workplace accidents and injuries. Subcontractors shall ensure that the appropriate signs, signals, and barricades are used during construction activities in accordance with the following health and safety documents:

- 29 CFR Part 1926.200 - 203 (Subpart G) Signs, Signals, and Barricades
- HSP 10.01, Physical Hazards, Barricades, and Accident Prevention Signs and Tags
- Site Procedure 1-C18-HSP-24.01, Construction Safety and Health Requirements

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that the required signs are visible at all times when work is being performed, and are removed or covered promptly when the hazards no longer exist. Signs shall incorporate appropriate safety colors. Subcontractors shall ensure that when signs, signals and barricades do not provide the necessary protection on or adjacent to a highway or street, flagmen or other appropriate controls are provided.

## **7.4 EXCAVATION AND TRENCHING**

Soils Disturbance Packages will be developed by the Excavation Specialists or representative for construction activities or projects where excavation and trenching will occur. The Construction Coordinator shall provide the guidance and requirements for all excavation and trenching activities. The Constructor shall address, as part of PHA, safety and health requirements for all excavations that will be more than four feet in depth. The Constructor shall define how the excavation will be performed and inspected by the Constructor's competent person so as to eliminate or reduce potential hazards to employees.

## **7.5 HAZARDOUS MATERIALS**

All flammable or combustible liquid metal containers shall be properly labeled, approved, and in good condition. Containers must also have a spring closing device and flame arrestor. Flammable liquid storage cabinets shall be provided for the storage of flammable or combustible liquids in their original containers. A list of hazardous materials, along with the Material Safety Data Sheet (MSDS) forms, shall be forwarded to Construction Management for review prior to bringing the materials onsite.

## **7.6 HEAVY EQUIPMENT AND VEHICLES**

The following construction equipment shall be inspected for compliance with safety requirements before being used on the construction site:

- Cranes
- Industrial lifts and fork trucks
- Elevating and rotating work platforms
- Earth moving equipment
- Drilling rigs
- Construction vehicles
- Roadway paving and maintenance equipment
- Mobile air compressors

Construction equipment that is found to be noncompliant with safety requirements shall be repaired or removed from RFETS. All safety deficiencies or violations that are noted during the inspections shall be tracked to verify that the equipment is repaired or removed from RFETS. All construction vehicles shall be equipped with back-up alarms. The back-up alarms are to be electronic, gear actuated, and shall alarm continuously while the vehicle/equipment is in reverse motion.

## **7.7 HOISTING AND RIGGING**

All hoisting or lifting devices shall be approved by the RMRS Safety department. Certification of inspection of all equipment shall be provided to the Safety department. Prior to making a lift, the Hoisting and Rigging Checklist (RF-48040) required by HSP 12.02, *Hoisting and Rigging*, shall be completed to ensure that the lifting activity has been reviewed and properly classified. A specialized rigging and lifting plan shall be developed if required.

## 7.9 WEATHER

The Subcontractor shall limit or curtail demolition activities or work immediately upon receipt of such instructions from the Construction Manager or Occupational Safety for the following conditions:

- Excessive wind speeds
- Lightning
- Inclement weather

## 7.10 ELECTRICAL EQUIPMENT

All portable generators shall have their frames externally grounded or the generator must have been certified so that there is not a potential for circuit to frame conductivity. Ground fault circuit interrupters (GFCI) shall be used in conjunction with temporary or permanent electrical services during all construction activities. Workers shall use insulated gloves and factory-insulated tools when working on energized electrical circuits. No work will be performed on energized electrical equipment without a completed Energized Equipment Permit signed by the Operations Manager or designee. Electrical equipment shall be isolated and locked or tagged HSP-2.08, *Lockout/Tagout* prior to work being performed.

Subcontractors shall address electrical safety requirements necessary for the safeguarding of employees involved in construction work. Subcontractors shall ensure that only trained and qualified electrical workers are assigned to perform work on electrical equipment, components, and systems. Subcontractors must ensure that the proper electrical safety requirements are used in accordance with the following health and safety documents:

- 29 CFR Part 1926.400 - 449 (Subpart K) Electrical
- HSP 15.00, Electrical Safety Practices
- Site Procedure 1-C18-HSP-24.01, Construction Safety and Health Requirements

At a minimum, subcontractors are responsible for the applicable requirements established in these documents. This includes ensuring that all personnel receive electrical training adequate for their job responsibilities. Subcontractors will ensure that personnel who install, repair, or remove electrical equipment are informed of site-specific hazards so that they may follow special precautions to prevent environmental and personnel contamination. Electrical equipment and circuits shall be considered energized unless they are positively determined to be de-energized by a qualified electrical worker. Physical safety barriers, warning signs, and labels must be used in accordance with regulatory requirements and site procedures. Portable electrical tools, equipment, and cords must be of satisfactory condition so that they do not cause harm to personnel or property.

## 7.11 SITE SECURITY

Some construction projects are located in a controlled access area. Entry into these areas are limited to personnel requiring access. Task requiring access are routine operations, maintenance, and performing activities to support the D&D process.

Personnel requiring access must have completed the required training, medical surveillance, and wearing the prescribed PPE, as well as signed-in on the RWP and AHA, as applicable.



## 8.0 MEDICAL SURVEILLANCE

Project personnel who are or may be exposed to hazardous substances or health hazards will receive hazardous waste worker medical surveillance as specified in 1910.120 (f) and 1926.65 (f).

In addition, and in accordance with 29 CFR 1926.62, personnel potentially exposed to lead will receive a baseline blood test for lead and zinc protoporphyrin. Asbestos workers will conform to medical monitoring requirements as defined in 10 CFR 1926.1101 and HSP-9.09, *Safe Handling of Asbestos*.

## 9.0 PERSONAL PROTECTION EQUIPMENT PROGRAM

PPE for the project will be selected by an IH&S personnel for the specific hazards to be encountered. Workers will be trained in the use, maintenance, and disposal of the PPE assigned to them in accordance with applicable PPE requirements and the RFETS respiratory protection program.

At a minimum, workers entering the Building 123 Cluster will be required to wear:

- Steel-toed safety shoes
- Eye protection with side shields
- Hard hat in posted hard hat areas

To enter Radiological Controlled Areas or buffer areas in the 123 Cluster, workers will normally be required to wear the following:

- Steel-toed safety shoes
- Eye protection with side shields
- RFETS company provided long sleeve coveralls
- RFETS company provided Tyvek or cotton coveralls
- Gloves and shoe covers
- Respiratory protection as described by the AHA or RWP

As job conditions dictate, the IH&S group will evaluate the specific PPE for each particular task. Evaluations will verify that the appropriate PPE is being used for the potential job hazards.

When prescribing PPE, the IH&S group will consider the following factors:

- Permeability, degradability, penetrability by specific agents expected for the job task(s)
- Heat/cold (thermal effects)
- Durability
- Flexibility

- Ease of decontamination
- Compatibility with other equipment
- Special conditions (fire, explosive, electrical, chemical, radiological, O<sub>2</sub> deficient atmospheres, etc.)

## **10.0 DECONTAMINATION PROCEDURES**

Specific decontamination procedures, as applicable and depending on the hazard, will be addressed as required by the RFETS Site RCM, Part 4, Section 541.

### **10.1 RADIOLOGICAL**

Decontamination for potential radiological contamination will be performed in accordance with the applicable procedures in the Health and Safety Practices Manual and Radiological Operating Instructions Manual and as specified in the RWP.

### **10.2 LEAD**

Decontamination of lead will be performed in accordance with 29 CFR 1926.62 (g), (h), (i), and project specific Lead Compliance Plans. All AHAs for lead work will have the approval of an RMRS IH&S Industrial Hygienist.

### **10.3 ASBESTOS**

Removal of asbestos containing materials will be performed in accordance with 29 CFR 1926.1101, EPA 40 CFR 763 and the Health and Safety Practices Manual. All AHAs and asbestos work plans will be approved by an RMRS IH&S Hygienist.

## **11.0 HEALTH AND SAFETY TRAINING**

### **11.1 PROJECT-SPECIFIC/GENERAL EMPLOYEE TRAINING**

All project field personnel shall receive pre-construction Safety and Health orientation in accordance with Section 8.1 of Site Procedure 1-C18-HSP-24.01. As applicable for the work task project field personnel shall receive project specific safety and health training, and RFETS site-specific safety and health training, regarding the following topics:

- Key project personnel and chain of authority;
- Safety, health, and other known hazards present on the project;
- Use of PPE;
- Work practices;
- Engineering controls;
- Medical surveillance requirements, including recognition of symptoms and signs which might indicate over exposure to hazardous/chemical materials and heat stress;
- Emergency Procedures;

- Hazard Communication;
- General Employee Training;
- Hearing Conservation;
- Asbestos Awareness;
- Nuclear Materials Handlers and Transporters;
- 40-hour Hazwoper Training and 8-hour annual Hazwoper refresher, as necessary
- 8-hour Hazwoper Supervisor Training, as necessary

Before starting any phase of construction work, all employees shall be trained in recognition of construction safety and health hazards to include the recognition and avoidance of unsafe conditions and required proper protective measures. All employees engaged in construction activities shall have completed all OSHA required training for the activity being performed. Depending on the job task, this may include but is not limited to:

- |                                |                                    |
|--------------------------------|------------------------------------|
| • Asbestos Awareness           | • Electrical Safety                |
| • Confined Space Entry         | • Glovebag Usage                   |
| • Lead Awareness               | • Ladder Safety                    |
| • PCB Awareness                | • Forklift Usage                   |
| • Aerial Lift                  | • Hoisting Apparatus               |
| • Fall Protection              | • Proper Tool and Machine Guarding |
| • Scaffolding Usage            | • Welding/Cutting Operations       |
| • Lockout/Tagout               | • Demolition                       |
| • Basic Respiratory Protection | • Ergonomics                       |

Individuals will be trained in their specific job task(s). The Site-specific training shall be performed as part of pre-job briefings, AHA briefings, "tool-box" safety training, or regular safety meetings. Retraining shall be conducted whenever this HASP is revised and where it impacts field conditions, new AHAs are developed or when AHAs are revised due to work conditions changing. General Health and Safety Training (i.e., asbestos, lead, beryllium, and radiological) will be listed in the AHA and/or RWP and will be conducted in accordance with general employee training procedures. Site-specific HASP Training will be documented on Appendix B by the Craft Foreman, Construction Engineer, or IH&S Lead or designees.

## **11.2 RESPIRATOR TRAINING**

Employees required to wear respiratory protection must be trained and fit-tested. Annual Respiratory Indoctrination (computer-based training), medical evaluation, and fit-test is required for all respirator use. Personnel shall be trained to a level appropriate for the type of respiratory protection they are required to use. Respirator qualification and usage for asbestos, radiological, or lead will follow the specific requirements for that hazard in regards to fit test frequency, medical qualifications, etc.

### **11.3 LEAD WORKER TRAINING**

Employees potentially exposed to lead must have Lead Worker Awareness Training.

### **11.4 ASBESTOS TRAINING**

Employees working in areas where asbestos is present are required to have Asbestos Awareness Training. Employees likely to disturb asbestos containing materials in the course of work, are required to have Asbestos Worker Training per the HSP 9.09, *Safe Handling of Asbestos* and completed training in accordance with OSHA 1926.1101.

## **12.0 EMERGENCY RESPONSE**

### **12.1 PRE-EMERGENCY PLANNING**

All field project personnel will be informed of the site emergency response procedures. This information will be provided prior to personnel working onsite.

### **12.2 COMMUNICATION**

All incidents requiring emergency response shall be called-in to extension 2911. The RMRS Project Manager must also be notified at extension 7419.

### **12.3 SAFE DISTANCES AND PLACES OF REFUGE**

In the event of an incident requiring emergency evacuation of the facility, all personnel will evacuate, follow life safety/disaster warning instructions, and assemble at the designated 123 assembly areas.

### **12.4 EVACUATION ROUTES**

Evacuation routes will be posted at various locations within the building(s) and project personnel will be informed of the routes during pre-evolution briefings. As the building layout changes due to decommissioning activities, project personnel will be briefed on the revised primary and secondary evacuation routes.

### **12.5 EMERGENCY MEDICAL TREATMENT AND FIRST AID**

Emergency medical assistance can be obtained by calling extension 2911 by phone. Site Emergency Response personnel will determine if off-site medical transportation and assistance is required. Individuals requiring non-emergency medical treatment or first aid will be transported to the Occupational Health Clinic, Building 122 for treatment. The Project Manager will be immediately notified of any such incidents.

### **12.6 PPE AND EMERGENCY EQUIPMENT**

The project will maintain PPE necessary to perform work as outlined in the AHAs. Additionally, fire extinguishers will be available at the project site. The RFETS Fire Department and Hazardous Materials Team maintains a supply of additional emergency equipment.

## 13.0 SPILL RESPONSE

All spill response will be performed in accordance with HSP 21.04, Emergency Response and Spill Control. Project personnel will respond only to incidental spills as defined in HSP 21.04. All other spills of radioactive material or hazardous materials will be reported to extension 2911, and the project area evacuated.

## 14.0 PRE-CONSTRUCTION ACTIVITIES

The Subcontractor shall submit a final report to the Construction Coordinator detailing their safety and health performance during the construction activity or project. The final report shall be in the form of self-assessment and will evaluate the safety and health performance of all subcontractors, lower-tier subcontractors, and vendors. The final report shall include the following:

1. A copy of the Daily Log maintained by the designated Safety and Health representative.
2. Copies of all accident and incident investigation reports.
3. Total number of first-aid cases incurred
4. Copies of the OSHA 200 Logs for all project personnel
5. Final totals of employee hours worked for all project personnel.
6. Copies of all OSHA, DOE, and Rocky Flats safety and health training records, safety meeting reports, and attendance rosters associated with the performance of the construction project or activity.

The Construction Coordinator shall provide an independent evaluation of the safety and health performance of the Subcontractor to the following individuals or departments within 10 working days of the completion of the project.

1. Construction Manager
2. Project Manager
3. Occupational Safety

## 15.0 RECORDKEEPING REQUIREMENTS

Any individual experiencing an injury or illness shall report to the Contractor's Occupational Health department for evaluation. All accident and incident investigation reports shall be completed on DOE Form 5484X, Individual Accident/Incident Report of the Contract Document; Section 01700.

**Note:** Rocky Flats requires that all occupational injuries or illnesses, motor vehicle accidents resulting in more than \$500.00 damage, personal injury, property damage incidents, or fires resulting in \$1,000.00 or more in damage be investigated and reported.

A properly completed Individual Accident/Incident Report shall be submitted to the Construction Coordinator within 24 hours of the accident or incident. The following information shall be maintained and provided to the Construction Coordinator by the third working day of each month or at the completion of the construction activity, whichever comes first:

1. Requested information pertinent to first-aid cases
2. Employee hours worked
3. OSHA incidence rates for the construction activity or project in progress or completed.

The same statistical information shall be submitted for any construction subcontractor, lower-tier subcontractor, and vendor who has performed work on the construction activity or project. Any subcontractor performing construction at RFETS shall maintain and make available for review an up-to-date OSHA 200 Log pertinent to construction activities at RFETS.

The following records shall be maintained for subcontractors, lower-tier subcontractors, and vendors during the performance of the construction project or activity:

1. First-aid cases
2. Employee hours worked
3. OSHA 200 Logs
4. OSHA incident rates

## **16.0 POST-CONSTRUCTION ACTIVITIES**

The Constructor shall submit a final report to the Construction Coordinator detailing their safety and health performance during the construction activity or project. The final report shall be in the form of self-assessment and will evaluate the safety and health performance of all subcontractors, lower-tier subcontractors, and vendors. The final report shall include the following:

1. A copy of the Daily Log maintained by the designated Safety and Health representative.
2. Copies of all accident and incident investigation reports.
3. Total number of first-aid cases incurred.
4. Copies of the OSHA 200 Logs for the Constructor and all subcontractor personnel.
5. Final totals of employee hours worked for the Constructor and all subcontractor personnel.
6. Copies of all OSHA, DOE, and Rocky Flats safety and health training records, safety meeting reports, and attendance roster associated with the performance of the construction project or activity.

The Construction Coordinator shall provide an independent evaluation of the safety and health performance of the Constructor to the following individuals or departments within 10 working days of the completion of the project.

1. Construction Manager
2. Project Manager
3. Occupational Safety

## 17.0 RECORDKEEPING REQUIREMENTS

Any individual experiencing an injury or illness shall report to the Contractor's Occupational Health department for evaluation. All accident and incident investigation reports shall be completed on DOE Form 5484 X, Individual Accident/Incident Report of the Contract Document; Section 01700.

**Note: Rocky Flats requires that all occupational injuries or illnesses, motor vehicle accidents resulting in more than \$500.00 damage, personal injury, property damage incidents, or fires resulting in \$1,000.00 or more in damage be investigated and reported.**

A properly completed Individual Accident/Incident Report shall be submitted to the Construction Coordinator within 24 hours of the accident or incident. The following information shall be provided to the Construction Coordinator by the third working day of each month or at the completion of the construction activity, whichever comes first:

1. Requested information pertinent to first-aid cases
2. Employee hours worked
3. OSHA incidence rates for the construction activity or project in progress or completed.

The same statistical information shall be submitted for any construction subcontractor, lower-tier subcontractor, and vendor who has performed work on the construction activity or project. Any subcontractor performing construction at Rocky Flats shall maintain and make available for review an up-to-date OSHA 200 Log pertinent to construction activities at Rocky Flats. The following records shall be maintained for subcontractors, lower-tier subcontractors, and vendors during the performance of the construction project or activity:

1. First-aid cases
2. Employee hours worked
3. OSHA 200 Logs
4. OSHA incident rates

**Appendix A**  
**Activity Hazard Analysis**



## ACTIVITY HAZARD ANALYSIS

Activity Hazard Analysis Number: \_\_\_\_\_

Building/Room: \_\_\_\_\_

Job Title/Project: \_\_\_\_\_

Activity/Job Description: \_\_\_\_\_

| Step | Potential Hazard | Protective Control Measures |
|------|------------------|-----------------------------|
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |
|      |                  |                             |

| IH&S Training Required | Safety/Special Equipment/Tools Required | Other Requirements Or Hold Points |
|------------------------|---|-----------------------------------|
|                        |   |                                   |
|                        |   |                                   |

JOB SUPERVISOR CONCURRENCE: \_\_\_\_\_

IH&S CONCURRENCE: \_\_\_\_\_

IH&S CONCURRENCE: \_\_\_\_\_

**Appendix B**  
**HS&P/AHA Briefing Sheet**

I have read and/or been briefed on the contents of this Health and Safety Plan/Job Safety Analysis and agree to abide by all requirements and stipulations incorporated.

[illegible]